Motivation Science and Game Design
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Purpose
- A general introduction to the endogenous and exogenous factors related to motivation and how they interact
- To describe how people adopt, mentally represent, experience, and act upon goals

Intrinsic & Extrinsic Motivation
- Intrinsic motivation
  - The desire to engage in an activity because we enjoy it or find it interesting, not because of external rewards or pressures
- Extrinsic motivation
  - The desire to engage in an activity because of external reasons, not because we enjoy the task or find it interesting

Effects of External Rewards
- Overjustification effect
  - The tendency of people to view their behavior as caused by compelling extrinsic reasons, making them underestimate the extent to which it was caused by intrinsic reasons.
  - Earning credits and trophies for playing math games decreased intrinsic motivation (Greene, Sternberg, & Lepper, 1976)
- Overjustification effects can be avoided
  - Rewards will undermine interest only if interest was initially high
  - The type of reward makes a difference. Performance-contingent rewards might do better than task-contingent rewards

Effects of External Rewards
- Lots of games these days use trophies and other rewards.
- How is this affecting the player’s experience?
- Are there aspects of games that attenuate the expected overjustification effects?
- What if the game is designed for educational purposes?

Achievement Goal Theory
- Proposes that understanding the meaning of goal engagement is key to understanding achievement motivation
- Goal orientations create frameworks which influence people’s engagement in goals, and the interpretations and reactions to achievement-related situations

E.g., Elliot, 2005; Hsueh et al., 2000
Achievement Goal Theory

- **Approach**
  - Performance: Demonstrate or validate competence
  - Mastery: Develop competence

- **Avoid**
  - Avoidance of appearing incompetent
  - Avoid not developing competence

Achievement Goal Structures

- Refers to the way in which instructors/environments establish routines, set up rules, assign tasks, and evaluate students (Ames, 1992)
- Goal structures can invoke particular goals and achievement-related outcomes (Church, Elliot, & Gable, 2001)

Achievement Goal Theory

- What aspects of games invoke goal orientations, and which ones do they invoke?

Interest

- Situational interest
  - Two kinds: triggered SI and maintained SI
    - Maintained SI is composed of feeling and value

- Individual interest
  - A dispositional tendency to engage and reengage in particular content and events over time (Rathunde, 1993; Renninger, 2000; Renninger, Hidi, & Krapp, 1992; Schiefele, 1991)

Interest

- What kinds of games utilize a design based on individual interest?
- What kinds of games utilize a design based on situational interest?

Affect

- Positive affect signals that needs are taken care of and that other goals can be addressed (Carver, 2003)
  - It has a "broaden and build" effect (Fredrickson, 1998, 2001)
  - E.g., it induces creativity (Isen, 1987) and prosocial behavior (Isen & Levin, 1972)
- Negative affect signals that particular needs or goals need to be addressed
  - It has a "narrowing" effect (Carver, 2003; Fredrickson, 2003)
Affect

- How has affect been used in games to invoke particular goal orientations?
- Were they appropriate/successful?

Social Facilitation & Social Loafing

- Social Facilitation
  - The tendency to do better on simple tasks and worse on complex tasks when in the presence of others and when individual performance can be evaluated
- Social Loafing
  - The tendency for people to do worse on simple tasks but better on complex tasks when they are in the presence of others and their individual performance cannot be evaluated

Social Facilitation & Social Loafing

- What aspects of game play might elicit social facilitation and prevent social loafing?

Anxiety: Yerkes & Dodson Law

- Yerkes & Dodson, 1908

Stereotype Threat

- The apprehension experienced by members of a group that their behavior might confirm a cultural stereotype (Steele, 1997)
  - E.g., When under evaluative conditions, African American students tend to be concerned about confirming the existing negative cultural stereotype of "intellectual inferiority."
Stereotype Threat

Stone et al. (1999) found that when a game of miniature golf was framed as a measure of “sport strategic intelligence,” Black athletes performed worse than Whites. When the game was framed as a measure of “natural athletic ability,” however, Black athletes outperformed the Whites.

Spencer et al. (1999) found that women who were led to believe that a particular test was designed to show differences in math abilities between men and women, performed worse than men. When they were told the same test was gender-neutral, they performed as well as men.

White males also experience stereotype threat when compared to Asian-Americans (Aronson et al., 1999).

Is this problem with games these days?

What might this say about the development of educational games?

Regulatory Focus Theory

The theory proposes that there are two motivational orientations:

- A promotion focus refers to a motivational orientation toward ideal (e.g., advancement, aspiration, accomplishment)
- Associated with eager-related means of goal pursuit
- A prevention focus refers to a motivational orientation toward oughts (e.g., protection, safety, responsibility)
- Associated with vigilance-related means of goal pursuit

Regulatory Fit

Occurs when the manner of engagement in an activity sustains (rather than disrupts) their current motivational orientation or interests (Higgins, 2005)

How do games induce promotion and prevention foci?

Can you think of examples?

Self-Regulatory Depletion

Suggests that we have a finite pool of self-regulatory resources and that acts of self-control (i.e., consciously overriding automatic responses) deplete those resources (e.g., Muraven & Baumeister, 2000)

Subsequent acts of self-control may suffer when resources are depleted

Resources can be strengthened (see Muraven & Baumeister, 2000), restored by multiple means (e.g., Tice et al., 2007, Gailliot & Baumeister, 2007) and conserved (Muraven et al., 2006)

How can games be designed to restore or conserve the player’s resources?

Would it ever be advantageous for the player to be depleted?
Implicit Goal Pursuit: What is Being Primed?

- Dijksterhuis and van Knippenberg (1998) found that people performed better on Trivial Pursuit when they were primed with the stereotype of a professor as compared to a “soccer hooligan.”

Goal Setting Theory

- Goals that are challenging and specific are most effective (e.g., Locke & Latham, 2002)

Implementation Intentions

- Goals are effectively implemented when a specific plan is explicitly made
- “When I encounter situation X, I will implement goal-related behaviors Y” (Gollwitzer & Brandstatter, 1997).
- These plans can also result in the automatic implantation of the plan (Sheeran, Webb, & Gollwitzer, 2006)

Application

- How would you apply these theories and principles to the games you are currently designing? Think about (choose the 3 or 4 most relevant): Reward systems, Achievement goal orientation and goal structure, Individual and situational interest, Affect, The presence of other players (real, virtual, or imagined), Self-regulation (promotion and prevention) and depletion, Priming, Goal-setting, Implementation intentions.